

Annual Report and Plan of Work
for the



State Water Planning and Review Process

Submitted to the Governor and Legislature
by the
Director of the Nebraska Department of Natural Resources

September 2011

Annual Report and Plan of Work

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	STATEWIDE ACTIVITIES.....	2
	A. General Planning Activities and Studies	
	1. Annual Evaluation of Hydrologically Connected Water Supplies	
	2. Development of an Integrated Network of Scientific Information and GeoHydrologic Tools to Assist Examination of Planning Options	
	3. Statewide CROPSIM and Water Supply and Demand Analysis Project	
	4. Examination of Potential Strategic Water Planning Activities and Options	
	B. Datasets/Data Gathering	
	1. Stream Gaging Program	
	2. Water Rights Digitizing	
	3. Flood Prone Area Mapping	
	4. National Hydrography Dataset	
	5. Nebraska Rainfall Assessment and Information Network	
	6. Watershed Boundary Delineation	
	7. Section Corner Database	
	C. Other Statewide Activities	
	1. Natural Resources Development Fund	
	2. Interrelated Water Management Plan Program Fund	
	3. Climate Assessment and Response Committee	
	4. Environmental Trust Technical Advisory Committee	
	5. Nebraska GIS Council and Subcommittees	
	6. Nebraska Environmental Trust Funded Studies	
	7. Hazard Mitigation Planning/Flood Mitigation Planning	
	8. Western States Water Council	
	9. Interstate Council on Water Policy	
	10. Association of Western States Engineers	
III.	PLATTE RIVER BASIN ABOVE COLUMBUS.....	13
	A. Integrated Water Management Activities/Integrated Management Plans	
	B. Studies, Programs, and Projects	
	1. Platte River Recovery Implementation Program	
	2. Platte Basin Habitat Enhancement Program	
	3. Platte River Cooperative Hydrology Study	
	4. Western Water Use Modeling	
	5. Lodgepole Creek Flow Evaluation	
	6. Overappropriated-Fully Appropriated Study	
	7. Excess Flow Analysis	
	8. Groundwater Recharge Pilot & Flood Reduction Project	
	C. North Platte Decree Implementation	
	D. South Platte Compact Activity	
	E. Gaging Activity	

IV.	LOWER PLATTE RIVER BASIN	24
	A. Integrated Water Management Activities	
	B. Studies, Programs, and Projects	
	1. Lower Platte River Corridor Alliance	
	2. Lower Platte River Cumulative Impacts Study	
	3. Elkhorn River Streambed Conductance Project	
	C. Gaging Activity	
V.	REPUBLICAN RIVER BASIN	26
	A. Integrated Water Management Activities/Integrated Management Plans	
	B. Studies, Programs, and Projects	
	1. Frenchman Valley Appraisal Study	
	2. Republican River Basin Conservation Study	
	3. Research on Estimation of Evapotranspiration from Riparian and Invasive Species using Remote Sensing, Modeling and In Situ Measurements in the Republican River Basin	
	4. Republican River Basin Water Sustainability Task Force	
	5. Republican River Basin Conjunctive Management Study	
	C. Republican River Compact Activity	
	D. Gaging Activity	
VI.	NIOBRARA RIVER BASIN.....	31
	A. Integrated Water Management Activities/ Integrated Management Plans	
	B. Studies, Programs, and Projects	
	1. Hydrogeologic and Hydrostratigraphic Framework for the Niobrara Basin	
	2. Conjunctive Water Use Model of the Upper Niobrara River Basin	
	3. Niobrara Basin Study	
	C. Compact Activity	
	D. Gaging Activity	
VII.	BLUE RIVER BASIN	33
	A. Integrated Water Management Activities	
	B. Blue River Compact Activity	
	C. Gaging Activity	
VIII.	MISSOURI RIVER MAINSTEM BASIN AND TRIBUTARIES AND THE NEMAHA RIVER BASIN.....	34
	A. Integrated Water Management Activities	
	B. Studies, Programs and Projects	
	1. Missouri River Association of States and Tribes (MoRAST)	
	2. Missouri River Recovery Implementation Committee (MRRIC)	
	3. Missouri River Ecosystem Restoration Plan (MRERP)	
	4. Missouri River Recovery Program (MRRP)	
	5. Missouri River Authorized Purposes Study (MRAPS)	

	6. Other Missouri River Activity	
	a. Master Manual/Annual Operating Plan	
	b. Surplus Water Issues	
	C. Gaging Activity	
IX.	PLANNING AND REVIEW PROCESS EXPENDITURES FY 11 AND BUDGET FYs 2012-2016 (Table 1).....	38

TABLE

Table 1 - Planning & Review Process Expenditures FY 10
and Budget FYs 2011-2015

I. INTRODUCTION

The Nebraska State Water Planning and Review Process was initiated in 1978 to redirect and accelerate Nebraska's water planning efforts. This Annual Report and Plan of Work summarizes work completed as part of that process in FY 11 and presents a work program and budget for future fiscal years. This is a report of the Director of Natural Resources and is submitted in compliance with *Nebraska Revised Statutes* § 2-15,106.

Neb. Rev. Stat. § 2-15,106 provides that:

“On or before September 15 for each odd-numbered year and on or before the date provided in section 81-132 for each even-numbered year, the director shall submit an annual report and plan of work for the state water planning and review process to the Legislature and Governor. The report shall include a listing of expenditures for the past fiscal year, a summary and analysis of work completed in the past fiscal year, funding requirements for the next fiscal year, and a projection and analysis of work to be completed and estimated funding requirements for such work for the next succeeding four years. The explanation of future funding requirements shall include an explanation of the proposed use of such funds and the anticipated results of the expenditure of such funds. The report shall, to the extent possible, identify such information as it affects each agency or other recipient of program funds. The explanation of future funding requirements shall be in a form suitable for providing an explanation of that portion of the budget request pertaining to the state water planning and review process.”

This year's report reflects the Department of Natural Resource's transition to use of river basins and the integrated water management planning process as an organizational framework for its planning efforts. Much of this report is organized by the basins shown in Figure 1 below. All of the staff work of the Department's Integrated Water Management Division and Planning Assistance Division, as well as planning efforts that occur through the Department's Floodplain/Dam Safety/Survey Division are considered to be part of the Nebraska State Water Planning and Review Process. This includes stream gaging activity and activities supporting implementation of the North Platte Decree.

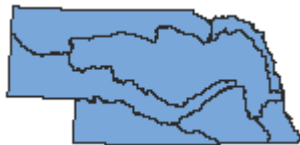


Figure 1

Of special note this year is that Department staff has begun meeting with the Public Policy Center of the University of Nebraska to consider first its internal operations in regard to water planning and then to begin assessing potential methods of iteratively building a strategic planning process that can be used to gather input, produce needed information, and provide a framework for addressing future state level water planning needs.

As in past years, implementation of the Groundwater Management and Protection Act has been one of the most important planning activities and the major focus of the Department's Integrated Water Management Division. The Department expects this to be a major activity for both the Department and the State's natural resources districts in the future. Two primary basin-oriented aspects of Groundwater Management and Protection Act implementation are the annual evaluation of hydrologically connected water supplies, and compilation of joint integrated management plans.

Other major basin-oriented planning efforts include the Platte River Recovery and Implementation Program and implementation of the Republican River Settlement.

Another focus of the State Water Planning and Review Process has been natural resources information management. The Department is currently examining methods of developing basin water supply and use information and has begun initial efforts to develop priority information. The longer term objective is to develop an integrated network of scientific information and geohydrologic tools that can be used to make informed water use and supply decisions throughout the State. Geographic Information Systems (GIS) and computer assisted data gathering, modeling, and analysis continue to be integral to the long-range planning and management of the State's water and soil resources.

Some of the information management activities discussed in this report are co-products of the Department's Management Services Division Information Technology Section and the Planning Assistance Division. This is a report of planning activities and includes no programmatic information about Information Technology Section initiatives. However, the Management Services Division Information Technology Section does play a major role in the basic planning activities listed. Other divisions within the Department also participate in planning activities. The Floodplain Management/Dam Safety/Survey Division conducts floodplain planning activities and the Department's legal staff provides input on many planning activities.

II. STATEWIDE ACTIVITIES

A. General Planning Activities and Studies

1. Annual Evaluation of Hydrologically Connected Water Supplies

On December 21, 2010, the Department published the sixth annual evaluation of the expected long-term availability of hydrologically connected water supplies, titled "2011 Annual Evaluation of Availability of Hydrologically Connected Water Supplies." Statute requires that the report be completed on an annual basis by January 1 of each year. The Integrated Water Management Division staff compiled the report using a variety of hydrologic, water use, and water rights information, and other related data.

According to statute, the Department is required to reach a preliminary conclusion about whether any additional basins are fully appropriated, beyond those previously identified as such by the

Department. A fully appropriated determination generally means that if not addressed through a planning process, conflicts will likely result between water users in the future.

In the 2011 report, the Blue River Basins, the Lower Niobrara River Basin, and Missouri Tributaries' Basins were evaluated. None of the basins, sub-basins, or reaches within those basins were determined to be fully appropriated. The Department did not evaluate the Lower Platte River Basin pursuant to *Neb. Rev. Stat. § 46-713(1)(a)*. Basins that had previously been declared fully appropriated or overappropriated were not evaluated. The next annual evaluation will be completed no later than the end of December 2011.

2. *Development of an Integrated Network of Scientific Information and GeoHydrologic Tools to Assist Examination of Planning Options*

The Department is currently working on development of an organizational structure for providing better information and tools relating to basin water supply and water use. Also being examined is what information is most useful for addressing planning needs and what priorities should be addressed first. In the longer term, the information can be used to provide a sound knowledge of water availability for examining planning options throughout the State.

3. *Statewide CROPSIM and Water Supply and Demand Analysis Project*

This project will provide data and information for use in determining water supplies and demands for all regions of Nebraska. One of the primary ways in which this effort could be used is to derive estimates of available water supplies--both current and historical. The analyses may be used to support the Department's annual Fully Appropriated Basins Report, to estimate the difference between fully and overappropriated conditions, to assist in the development of integrated management plan implementation projects, and other water efforts. The project has four major tasks.

Task 1 will be statewide application of the CROPSIM model. One of its outputs will be development of net irrigation requirements for up to five crops using a climate period of at least fifty years.

Task 2 will review the use of the CROPSIM model for quality control purposes.

Task 3 will involve retrieving surface water data, including diversion records and developing a common structure for managing data from different sources.

Task 4 will include development of a framework for identifying and incorporating the best available data and methodologies for water planning purposes.

The project involves both Department staff and contractor work. An agreement has been signed and the project has a term running through June 30, 2012.

4. Examination of Potential Strategic Water Planning Activities and Options

The Department has contracted with the Public Policy Center of the University of Nebraska for assistance in considering its internal operations in regard to water planning and to begin assessing potential methods of iteratively building a strategic planning process that can be used to gather input, produce needed information, and provide a framework for addressing future state level water planning needs.

B. Datasets/Data Gathering

1. Stream Gaging Program

Stream and canal gaging activities are considered to be part of the State Water Planning and Review Process. *Neb. Rev. Stat.* §§ 46-227, 46-252, 46-258, 46-261(3), 61-208, 61-209, 61-211, 61-215, and 61-216 authorize and require the Department to measure the quantity of water in the State's streams and canals. Department staff collects and reports flow data for streams, canal and pump diversions, and storage in reservoirs. Stream gaging is important for water administration, determining compliance with interstate compacts and decrees, and has major implications for a large number of environmental and discharge permits. Stream gaging data is important information for water planning. In addition, near real-time streamflow information is critical during floods.

The Department operates 103 continuous stream and reservoir gages, 112 canal and canal return flow gages, and makes spot measurements or observations of stage at approximately 100 sites operated by other agencies or districts. Twelve other gages are operated in cooperation with the U.S. Geological Survey.

At each site, streamflow is measured by two inter-related methods. First, streamflow is measured by field office personnel visiting each stream gaging site. The measurement takes approximately two hours at each site. Field personnel either use a rod-mounted flow meter while they wade the stream or a weighted flow meter lowered from a bridge or cableway. Many measurements, at various depths and at discrete locations across the stream, are combined together to determine the total discharge.

Stream flow calculated in this way and the measured water surface elevation are combined to create a rating table (or graphically, a curve). The rating curve is calibrated every one to two months at each stream gage, and more often on an as-needed basis. The rating table or curve will change depending on changing channel geometry due to scour or accretion.

Secondly, the stream water surface elevation is measured several times during each day using stationary equipment located in a gage house. These measurements have been made in the past using float systems or by measuring the pressure needed to push a nitrogen bubble out the end of a tube which is then equated to the depth below the water surface. The older floats and nitrogen-tank based systems are being replaced with small pump-based underwater bubbler systems or radar distance-finding gages located above the water surface.

Water surface elevation measurements made with the stationary equipment are typically recorded at 15-minute intervals. Water elevation information is uploaded to a centralized database using either a telephone or a satellite transmission system. Stream elevation information is converted to stream flow using a known relationship between water depth and velocity (often shown as a rating table or curve).

Significant funding is budgeted for ongoing stream gaging activities because of the importance of accurate, timely flow information. The Department has cut costs by minimizing the number of site visits needed to maintain accurate rating curves. While the stream gaging budget is a significant portion of the Department's budget, a recent study determined that Department's program is very cost effective when compared to the per-gage cost of the U.S. Geological Survey. When all expenses of the program, and all direct and indirect costs of labor related to the program are included, over the past five years the Department has spent approximately \$6,300 per gage per year for all measurements and stream and canal gaging record work. Currently the U.S. Geological Survey's cost per gage is \$15,000.

In the future, it is likely that the cost of maintaining stream gages will rise slightly. Additional costs will include necessary software upgrades, replacement of existing (outdated) nitrogen tank bubbler equipment, increased use of acoustic Doppler stream discharge measurement equipment, and related training. The Department is currently working on a written plan to assess and improve the program.

The Department publishes an annual Hydrographic Report and Station List that may be found on the internet at http://dnr.ne.gov/docs/DNR_Publications.html. Additional stream flow information may be found at <http://dnr.ne.gov/docs/hydrologic.html>.

2. Water Rights Digitizing

The digitizing of surface water rights in Nebraska is the responsibility of the Mapping Section within the Floodplain/Dam Safety/Survey Division. Since 2006 all new water rights and modifications to existing water rights have been created and maintained using GIS software. In addition, a program is in place to create digital versions of all other existing water rights. Of the 12 water divisions in Nebraska, the private rights (those not served by irrigation districts or other water providers) have nearly all been digitized and are available to Department staff for program purposes. The process of digitizing the lands served by the irrigation districts and ditch companies in Nebraska is much more difficult due to the complexities of how they have numerous water rights which interlock and overlap in various ways across their districts. The Department has been able to acquire digital versions of many irrigation districts by cooperative work agreements with the districts--either by providing mapping assistance or converting existing work into a format compatible with the Department's geodatabases. While great strides have been made in creating a digital database of Nebraska's surface water rights there are areas that pose significant difficulties due to a lack of current mapping information for some irrigation districts. Overall the process of digitizing the surface water rights is continuing at a good pace with more added each day, but having a complete statewide database is still years off.

Other responsibilities of the Mapping Section include:

- Maintaining the referencing of surface water rights information to the National Hydrography Database
- Creating and maintaining digitizing for the Department's Conservation Reserve Enhancement Program (CREP) and Environmental Quality Improvement Program (EQIP) programs
- Producing official maps for Department orders
- Scanning and processing existing project maps and design plans into digital format
- Creating and maintaining digitizing for conduct water permits

3. Flood Prone Area Mapping

This mapping activity/dataset is coordinated and primarily carried out through the Floodplain/Dam Safety/Survey Division. As of June 1, 2010, the Department and the Federal Emergency Management Agency's contractors have produced 52 county-wide digital effective Flood Insurance Rate Maps (FIRMs). Six of them became effective between July 1, 2010, and June 30, 2011. The mapping process was underway in another ten counties: four preliminary, one draft, and five work maps.

During this fiscal year, the Division completed the Lancaster and Colfax maps funded in the previous fiscal year. In addition, the Division completed the Phase III of the Coordinated Needs Management Strategy (CNMS) assessment for the Federal Emergency Management Agency. The Division also worked on two physical map revision projects for the Big Slough in Howard County and Little Bazile Creek in Knox County.

In the fiscal year 2011, the Division will complete the work maps for York, Jefferson, Seward, Hamilton and Adams counties. The work on Big Slough and Little Bazile Creek will be continued. A watershed based project for the Lower Little Blue watershed will begin. The Division will also apply for federal grants to carry out two Discovery projects in this fiscal year.

4. National Hydrography Dataset

The National Hydrography Dataset (NHD) is a dataset model developed jointly by the U.S. Geological Survey and the Environmental Protection Agency with a goal of providing a common reference digital hydrographic dataset for a wide cross-section of applications using data related to surface water features. It will enable spatial comparison of hydrographic data with a wide range of other data. More importantly, it will provide the basis for, or enhance the efficiency of, a wide range of potential water analysis activities. The National Hydrography Dataset data is available now for the entire State of Nebraska.

Department staff coordinates stewardship of the National Hydrography Dataset in Nebraska. In FY 11 Department staff participated in a number of National Hydrography Dataset advisory groups to improve maintenance tools, refine the capability to attach stream-related information and to update the data model. The National Hydrography Dataset is continuously maintained so that it remains a current dataset and is improved as Nebraska's requirements dictate. Department

staff are currently engaged in a major maintenance effort to add additional functionality to the dataset. A second grant has been secured from the U.S. Geological Survey to improve navigation capabilities of the dataset.

The dataset has been used as major input to a stream hydrology project to determine and publish hydrologic statistics for streams of interest in Nebraska. This project helps address requests for flood-related information, including discharge, stage, and flood elevation information. The dataset is currently being used as a framework to manage a variety of Department datasets including: water rights, dams, gages, and other water-related data. Department staff is developing applications designed to improve the quality of this information and our ability to create information products from it.

5. Nebraska Rainfall Assessment and Information Network (NeRAIN)

This program was initiated by the Department in cooperation with the natural resources districts in early 2004. It was funded in part through a grant from the Nebraska Environmental Trust and is patterned after the Community Collaborative Rain and Hail Study (CoCoRaHS) developed through Colorado State University. However, most of the participating natural resources districts have added it to their budget so NeRAIN would be maintained into the future. One goal of the project is to have one volunteer in every township in the rural areas of Nebraska and one per every square mile in the urban areas. It is all internet-driven with the website housed on the Department's website at <http://dnrdata.dnr.ne.gov/NeRAIN/index.asp>.

The NeRAIN network of volunteers spans all of Nebraska and between 800 to 900 volunteers entered data during this past year. In addition to maintaining the database and website on a daily basis, efforts are now being made to upgrade the server that distributes maps and reports of the data. This will require a re-write of several of the web pages to support new technologies that are available.

6. Watershed Boundary Delineation

This project to delineate the watersheds of Nebraska was actually started in the late 1980s and completed in the mid-1990s. Since that time, there have been three updates to improve the quality based on new technology. The latest update started in 2003 with the initial phase finished in 2005. This latest update brings the database into compliance with national standards. It is anticipated that national standards may change to reflect recent advancements in the distribution and accuracy of regional elevation data. As these improvements become more widespread, watershed boundary delineations may be updated to achieve accuracy comparable to the corresponding elevation.

Any future work on this project will be response to the acquisition of improved topographic data.

7. Section Corner Database

Legal sections are widely used for administration of lands and critical to proper legal description of property boundaries, as well as locating surveying monuments. This makes a spatial dataset

showing approximate legal sections a fundamental tool for any administrative agency. The original database was started in the early 1980s using processes and data that were available at that time.

In recent years, the Section Corner Database has been used internally for several projects and as it has been used, the accuracy has been improved. The improved information has been documented and is currently served to the public through the Department website. Future work on this database is not anticipated, but may be considered when potential improvements are identified.

C. Other Statewide Activities

1. Nebraska Resources Development Fund

The Nebraska Resources Development Act of 1974 created the Nebraska Resources Development Fund (NRDF) to assist with development and wise use of Nebraska's water and land resources. The Natural Resources Development Fund can be used to provide grants or loans to political subdivisions of the State or an agency of the State.

During FY 11, the Nebraska Natural Resources Commission (the Commission) met five times. The Nebraska Legislature held the FY 11 appropriation at \$3,140,325 the same as the FY 10 appropriation. One project near Leigh, Nebraska, Maple Creek Recreation project, was completed and held a grand opening during FY 11. This project's Natural Resources Development Fund funding is projected to be fully reimbursed by the end of FY12. Over its projected 50-year life, this project is expected to generate flood damage reduction benefits of \$2,211,050 and recreation benefits of \$14,283,100.

Five projects requested FY 12 obligations. The general fund appropriation of \$3.14 million was insufficient to meet that demand. After discussing project reviews, and considering the results of a project sponsor review and input meeting with staff, the Commission completed funding to the project near Leigh and split the remaining FY 12 funding equally between the remaining active projects. Three projects requested increases to their Allocation: Lower Turkey Creek, Little Sandy, and Western Sarpy/Clear Creek project to cover anticipated cost over-runs. The remaining amount of available allocation within the \$18.5 million cap imposed by the Legislature was awarded to the Pigeon/Jones Creek project which has yet to be fully allocated.

The current funding situation has caused project sponsors to borrow funds in order to complete their projects on a timely basis, in spite of knowing that it may be several years before they can be completely reimbursed by this fund. This situation prompted the Commission to take formal action to defer consideration of new project proposals and applications until one year after all previously approved projects are fully allocated.

2. Interrelated Water Management Plan Program Fund

The Interrelated Water Management Plan Program (IWMPP) was created in 2006 with the passage of LB 1226, Section 20. This grant program is intended to facilitate the duties of natural

resources districts arising under the Nebraska Ground Water Management and Protection Act, and to help offset costs incurred in performing those duties. Guidelines were adopted on July 13, 2006, and revised in November 2006; July 2007, November 2007; January 2009, and November 2009.

Guidelines state that multi-year projects previously funded by the program shall have priority in the allocation of each year's available funds. After reviewing projected FY 12 funding needs and the reduced FY 12 appropriation granted by the legislature (down over \$1.5 million from the previous year), the Commission decided to suspend consideration of new applications in FY 11. This deferral was subsequently extended until all existing projects have been fully funded. Staff reviewed project progress and the proposed work for each project requesting additional funding. Staff also spent considerable time closing out projects which had been completed or had received needed funding from other sources. The Commission committed a total of \$946,061 to on-going projects which represented \$500,000 in new appropriation from the Legislature plus \$446,061 returned to the fund through project close-outs. FY 12 grants equaled about half of amounts requested by project sponsors. Funding for FY 13 was set by the Legislature at \$500,000; \$1,587,487 remains to be obligated to fully fund existing projects.

3. Climate Assessment and Response Committee

The Climate Assessment and Response Committee (CARC) provides timely and systematic data collection, analysis, and dissemination of information about drought and other severe climate occurrences to the Governor and to other interested persons. The committee met on May 19, 2011. The Director of the Department is an ex-officio committee member. Although drought conditions were absent from the State at the time of the meeting, there was discussion of the drought conditions south of the State and the potential for those conditions spreading. There was also discussion of flooding potential on the Missouri and Platte rivers.

4. Environmental Trust Technical Advisory Committee

The Nebraska Environmental Trust Board, of which the Director of the Department is a member, has a 70-member Technical Advisory Committee (TAC) to help review grant applications. Applications are distributed to reviewers with backgrounds related to the specific types of project. Department staff has provided assistance in project application reviews since the Trust was established in 1992.

There were 143 applications received by the September 7, 2010, deadline. Two Department staff members reviewed a total of five project applications this year. The time involved was approximately two days total. The workload of this process varies by year depending on the types of projects proposed in the applications, the background of the reviewers, the project sponsors, and whether additional information is requested of the sponsor to complete the review. Any reviewer having a conflict of interest with a project is requested to declare that conflict and not review that particular application.

5. Nebraska GIS Council and Subcommittees

The Geographic Information System Steering Committee has been reconstituted as the Nebraska GIS Council (Council) under the Nebraska Information Technology Commission. The Council has adopted a number of priority initiatives for geographic information systems applications in Nebraska. The Department's geographic information systems coordinator serves on the Council.

Over the last year, the council has focused its planning efforts on the development of the Nebraska Map into a state GIS Services capable of making geographic information systems data and services available to a statewide audience. A second focus is the development of a current Strategic Plan for the State. Vendor proposals are being evaluated with an anticipated completion date of December 30, 2011.

The Council continues to work on the National Map Initiative, a statewide street centerline-address dataset, land record modernization, and archival of old imagery and historical maps.

6. Nebraska Environmental Trust Funded Studies

The Department has received Nebraska Environmental Trust grants for three separate projects. Each of those projects addresses research or educational needs closely related to the Department's integrated water management activities. In each instance the Department has signed agreements with the University of Nebraska to complete the work. All three of those projects were scheduled to be complete by the end of FY 10-11, but University researchers did not complete two of the projects by the June 30, 2011, deadline and one of those projects has received a formal extension.

The project entitled "Quantifying Evaporation, Crop Evapotranspiration, and the Water Balance for Tilled and Untilled Fields" was completed in late July 2011. The grant award totaled \$674,160 over three years.

The grants include a \$215,000 award for "Enhancing the Value of Water through Management Education," which is a joint effort between Nebraska's center pivot manufacturers and the University of Nebraska to provide education on optimal water use. The deadline for completion of that project has been tentatively extended to December 31, 2011. A related non-Department project "Conserving Water through Informed Irrigation Management," was also recently funded by the Nebraska Environmental Trust. This new project has many of the same objectives as the nearly completed DNR project, but with different strategies to reach irrigators, e.g., educational efforts at Husker Harvest Days and two-day irrigation schools at several locations across the State. The materials developed and printed, if an extension of the previous contract is granted, will be used as part of the educational programs in the new project.

A project entitled "Riparian Vegetation Impacts on Water Quantity, Quality, and Stream Ecology" has received a grant award of up to \$423,960 and is now expected to be completed by December 31, 2011.

7. Hazard Mitigation Planning/Flood Mitigation Planning

According to the Nebraska Emergency Management Agency (NEMA) approximately 90 percent of the State's population is now covered by an All Hazards Mitigation Plan. The State recently completed an update to the state level Hazard Mitigation Plan which includes information from our current Flood Mitigation Plan.

The Department has just received a Flood Mitigation Assistance grant from the Federal Emergency Management Agency to update the State's Flood Mitigation Plan that will then be incorporated into the State's All Hazard Mitigation Plan. These updates identify goals that can be achieved through mitigation thus giving communities the ability to apply for and receive grants to complete local projects. One such project that has received grant funding is in the Village of DeWitt for the installation of floodgates on several culverts that will prevent the repetitive flooding of eight homes from relatively minor flood events. With the recent flood events of the past two years there will be a significant amount of money allocated to the State for hazard mitigation projects. The Department will continue to offer technical assistance to any entity interested in making an application for flood loss mitigation planning and projects.

8. Western States Water Council

The Department is an official member of the Western States Water Council. This organization benefits the Department and the State by keeping abreast of water issues at the state, regional, and national levels. Director Dunnigan is the State's representative, with the Deputy Director being his alternate, and the Department's Agency Legal Counsel being a member of the legal subcommittee. The Western States Water Council meets twice a year with locations rotating amongst the states.

The Western States Water Council is an organization of representatives appointed by the governors of 18 western states, including Alaska, Arizona, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming.

Western States Water Council was chartered by the Western Governors' Conference in 1965 to:

- Accomplish effective cooperation among western states in the conservation, development and management of water resources;
- Maintain vital state prerogatives, while identifying ways to accommodate legitimate federal interests;
- Provide a forum for the exchange of views, perspectives and experiences among member states; and
- Provide analysis of federal and state developments in order to assist member states in evaluating impacts of federal laws and programs and the effectiveness of state laws and policies.

The Council is accountable to the Western Governors' Association (WGA). Even though Nebraska's Governor is currently not a member of the WGA, the Department, with the Governor's permission and the agreement of the WSWC, is able to participate.

Through the staff of the Western States Water Council, many studies and reports on important topics have been completed over the years that are very helpful to the Council's members, policy makers and the public. This information is available to the public through the Council's internet site at <http://www.westgov.org/wswc/>.

9. Interstate Council on Water Policy

The Interstate Council on Water Policy (ICWP) is a national organization of state and regional water resource management agencies. The Interstate Council on Water Policy is committed to seeking more comprehensive and coordinated approaches to water management that integrate quality and quantity concerns, ground as well as surface water management, and economic and environmental values. Within this context, the relationship between local, state, and federal policies, programs and regulatory issues is of particular interest.

The Interstate Council on Water Policy was founded in 1959 to provide a voice for the states in national water policy. Its scope of interest includes such issues as watershed management, dam safety, floodplain management, groundwater, nonpoint source pollution, water quality standards, water conservation, drought and emergency management, wetlands protection, state water rights, climate change, hydropower licensing, endangered species and habitat, water supply, and water resource research and data. More information on this organization may be found at http://www.icwp.org/cms/index.php?option=com_content&view=article&id=69&Itemid=56.

The Department's Director is the State's representative on this council.

The Department and Nebraska benefit from this organization through the exchange of ideas and information from other states and federal officials on issues that are of importance to Nebraska, through having recognized organizational presence at the federal level to provide input and information on issues of concern, and through building relationships with our counterparts in other states and at the federal level.

10. Association of Western States Engineers

The Association of Western States Engineers (AWSE) was formed in 1928 by the western state heads of agencies charged with administration of the laws governing appropriation and distribution or control of the water resources of each state. Its current membership includes 19 western states.

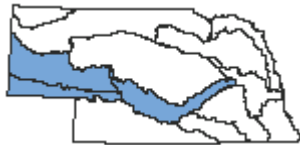
The AWSE purposes are:

- To formulate broad principles applicable to all those states for the development, use, control, and regulation of the waters thereof.

- To assist one another in the solution of individual problems through the exchange of ideas and experiences.
- To cooperate in preserving the states' inherent right to develop, use, control, and distribute the water thereof and to facilitate resolution of interstate water problems.
- To enhance the beneficial and efficient use of water by encouraging the improvement and perfection of the laws relating thereto and by other proper means.
- To circulate among members such information as may be helpful in the discharge of their official duties.

Director Dunnigan is the Department's representative. The Association of Western States Engineers meets once a year in the fall, with meetings rotating amongst the states. The Association of Western States Engineers also sponsors a Spring Workshop for the staff of the agencies and this year Nebraska was the host state and held the meeting in Nebraska City. Topics included such items as the current actions on the Missouri River, National Hydrographic Data Set, groundwater studies and modeling, environmental flow requirements, well grout study, integrated water management and modeling, and state reports.

III. PLATTE RIVER BASIN ABOVE COLUMBUS



A. Integrated Water Management Activities/Integrated Management Plans

The Upper Platte River Basin lies within six natural resources districts, including the Central Platte, North Platte, South Platte, Tri-Basin, Twin Platte, and Upper Big Blue natural resources districts. Areas of these natural resources districts were designated fully and/or overappropriated after the passage of LB 962 in 2004. In addition to an overappropriated Basin-Wide Plan for areas upstream of the Kearney Canal Diversion, each natural resources district is also required to have an individual integrated management plan (IMP), which addresses both the fully appropriated and overappropriated areas.

The Platte River Recovery and Implementation Program (PRRIP) has been an important consideration in shaping the goals and objectives of the Basin-Wide Plan. One of PRRIP's purposes is to mitigate the adverse impacts of certain new water-related activities through the implementation of state and federal depletions plans. Nebraska is charged with getting back to a July 1, 1997, level of development of water use and associated river depletions. New or expanded uses that result in streamflow depletions must be offset. There may be additional increments to address any remaining difference between an overappropriated and fully appropriated condition.

The Department and these natural resources districts completed integrated management plans for both the fully appropriated and overappropriated areas in 2009. The South Platte Natural

Resources District adopted an integrated management plan in 2008, which was modified in 2009 to conform with the Basin-Wide Plan. The integrated management plans contain the current best estimate of the balance of post-1997 depletions and accretions to the Platte River and the framework that provides the necessary measures to offset the remaining depletions within the integrated management plans' first increment. The Central Platte Natural Resources District is in the process of updating their current integrated management plan.

The Platte River Basin integrated management plans also contain a comprehensive program of monitoring and studies that are designed to assess the success of the integrated management plans and guide any modifications or improvements that may be necessary. The monitoring process will be used to determine the impacts of users on the water supply (both within the natural resources districts and basin-wide), to ensure that local priorities are represented, and to evaluate the long-term effectiveness of the integrated management plans.

The hydrologically connected waters of the Platte River Basin also extend into the Upper Big Blue Natural Resources District. The Department and the Upper Big Blue Natural Resources District have developed goals and objectives, defined a management area sufficient to meet the goals and objectives, drafted controls, and developed a plan to monitor activities in the management area and further develop existing tools to refine management capabilities in the future. The Department and the natural resources district conducted a stakeholder meeting and completed the formal hearing process. The integrated management plan becomes effective on October 18, 2010.

B. Studies, Programs, and Projects

1. Platte River Recovery and Implementation Program

On July 1, 1997, the Governors of Nebraska, Colorado, and Wyoming, and the U.S. Secretary of Interior signed a cooperative agreement outlining a proposed basin-wide recovery implementation program for endangered species in the Central and Lower Platte River basins. In October 2006, Nebraska Governor Heineman signed the formal document agreeing to the Platte River Recovery and Implementation Program (PRRIP). Since October 2008, the Integrated Water Management Division has provided major assistance to the Director in coordinating and conducting agency PRRIP efforts. Personnel from both the Nebraska Game and Parks Commission and the Nebraska Department of Environmental Quality are also carrying out work related to this project when their respective areas of expertise are relevant to the specific work tasks.

All Platte River Recovery and Implementation Program activities are overseen by a Governance Committee with representatives from ten federal, state, and local entities: U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, State of Colorado, State of Nebraska, State of Wyoming, downstream water users, South Platte water users, Upper North Platte water users, and two environmental groups.

The Governance Committee meets four times each year while the subcommittees meet more often to accomplish their tasks. The subcommittees are the Technical Advisory Committee

(TAC), Water Advisory Committee (WAC), Land Advisory Committee (LAC), Independent Scientific Advisory Committee (ISAC), and the Finance Committee (FC). Each has individual task and goals to accomplish and all report to the Governance Committee. Details about the Program can be found on this website: www.platteriverprogram.com.

The State of Nebraska is the 2011 Governance Committee Chair. A new database management system is being developed and the website is being updated to make access to the data gathered by the Program accessible to all parties and the public. A time-lapse photography project to be completed by Michael Forsberg and Mike Farrell was approved by the Program. The Program published an accomplishments summary document in this fiscal year.

The Program held many outreach efforts throughout the year in a variety of venues: reaching out to educate youth in the Kearney area; presenting and/or teaching at the University of Nebraska-Lincoln and the University of Colorado, Boulder; presenting, sponsoring or otherwise participating at many public events including the University of Nebraska-Lincoln summer water tour, Nebraska Grazing Conference, Nebraska State Fair, Husker Harvest Days, University of Nebraska-Lincoln Water Law Conference, University of Nebraska-Lincoln Greater Platte Symposium, Gateway Farm Expo, Natural Resources District Board meetings, the South Platte Forum, Four State Irrigation Council, Colorado Water Congress Annual Conference, US Committee on Irrigation and Drainage, and other local and interstate groups.

Land

Platte River Recovery Implementation Program's first increment objectives are to reduce stream flow shortages to the U.S. Fish and Wildlife Service "target flows" by 130,000 to 150,000 acre-feet per year at Grand Island and protect, restore and maintain at least 10,000 acres of land habitat for endangered species in the Lexington to Chapman reach of the river. The Governance Committee has moved forward with efforts in obtaining land and water. To date more than 8,600 acres have been acquired. Of these 8,600 acres, 3,000 are now open to the public through a contract between the Program and the Nebraska Game and Parks Commission. The Governance Committee of the Program approved a Public Access Policy with Nebraska Game and Parks Commission issuing one-day only permits through an on-line system. A copy of the policy can be found on the Program website.

Water

In the area of water the Governance Committee has signed memorandums of agreement with various water actions plan project sponsors and is conducting various feasibility studies on water action plan projects. At this time the Program is focusing on three priority projects: 1) groundwater recharge projects, one each on the north and south sides of the river; 2) a reregulating reservoir working in conjunction with The Central Nebraska Public Power and Irrigation District canal system; and, 3) leasing water from Pathfinder Reservoir. Work is also being done to implement a variety of other water projects such as water leasing agreements, a reservoir on Elm Creek and groundwater management. An important aspect of the water projects is getting water to the critical habitat reach from Lake McConaughy. Currently, moving significant water through the channel is difficult without causing flooding. The Program is investigating the causes of this and plans to have a better understanding of how to approach this issue based upon the results of a river modeling study.

Adaptive Management

Platte River Recovery Implementation Program documents outline a process in an adaptive management plan to test various hypotheses developed and prioritized by the Governance Committee members. Many monitoring and research aspects of the adaptive management plan are currently being implemented. For all purchased lands, a management plan must be adopted by the Governance Committee within a year of purchase. Many of the lands had management plans adopted in the past year. These plans describe the adaptive management actions and basic maintenance activities planned for each land tract and each land complex. Habitat enhancement bid packages have been let and work has been proceeding this year. The Program has several monitoring activities that are carried out throughout each year. These include, but are not limited to: LiDAR and Aerial Photography, geomorphology/in-channel vegetation, terns and plovers, water quality, and whooping cranes. Other major work in this area includes implementation of the sediment augmentation pilot project to test the hypothesis regarding sediment deficits in the river channel, the development of sandpit and riverine habitat for terns and plovers, and actions to test other aspects of the hypothesis regarding flow and sediment. All studies carried out under the adaptive management plan receive science review via the Independent Scientific Advisory Committee of the Program as well as other independently hired peer-review scientists. The Program contracts out for the services to hire these scientists.

Nebraska New Depletion Plan

The responsibility of Nebraska under the Platte River Recovery Implementation Program is to mitigate, offset, or prevent any new depletion to the river's target flows and State protected flows as part of the proposed program. This responsibility is defined in Nebraska's New Depletions Plan and is shared between the State of Nebraska and the natural resources districts. The Cooperative Hydrology Study (COHYST) models have been used to estimate the level of depletions caused by new groundwater irrigation uses that were begun between July 1, 1997, and December 31, 2005. In general, these are the depletions that Nebraska has committed to offset. CoHyst 2010 will be used to update the initial estimate of depletion and to run the analysis through the 2010 calendar year. In the spring of 2011 the Department and the Platte natural resources districts collaborated to implement a groundwater recharge pilot and flood reduction project. The full benefits of this project are still being analyzed, but initial data indicate that more than 85,000 acre-feet of excess flows were diverted from the North, South and Platte rivers this spring. Other collaborative efforts with the natural resources districts include the purchase or lease of surface water appropriations and groundwater rights; the north dry creek groundwater retiming project; and co-sponsoring of federal projects such as Agricultural Water Enhancement Program (AWEP), Environmental Quality Incentives Program (EQIP), and Conservation Reserve Enhancement Program (CREP) to retire water use. Current plans are to use FY 2012 funds to invest in more water action plan projects for the purpose of assisting Nebraska in meeting offset obligations under the New Depletion Plan.

2. *Platte Basin Habitat Enhancement Project*

The Platte Basin Habitat Enhancement Project (PBHEP) was established to provide an added solution to help landowners in the Platte River Basin meet the region's water needs, both for wildlife and for the State's valuable agricultural economy. Platte Basin Habitat Enhancement

Project is designed to help landowners make transitions that can maintain economic health while reducing depletions to the river. The sponsors of the project include the Department, Central Platte Natural Resources District, North Platte Natural Resources District, South Platte Natural Resources District, Tri-Basin Natural Resources District, Twin Platte Natural Resources District, and the Nebraska Game and Parks Commission. Platte Basin Habitat Enhancement Project is funded in part through a grant from the Nebraska Environmental Trust (NET). The Farm Bureau, the Nature Conservancy, and the Whooping Crane Trust are partners.

Funding for the first three years of the project is \$16,143,700. The Department will contribute \$6,023,000, natural resources districts will contribute \$6,765,200, Nebraska Environmental Trust will contribute \$3,000,000, the Nebraska Game and Parks Commission will contribute \$325,500, and the other partners will contribute \$30,000.

In a cooperative effort to further the funding and goals of the Platte Basin Habitat Enhancement Program, the Department and five natural resources districts applied for and subsequently received funding for a partnership under the Agricultural Water Enhancement Program (AWEP) administered through the U.S. Department of Agricultural Natural Resources Conservation Service. In the first contract year \$1,608,880 were obligated and in the second year \$656,439 were obligated. The partnership would be used to reduce water consumption in the critical habitat area of the Platte Basin through the conversion of agricultural land from irrigated farming to non-irrigated land uses. State and local partner funds would be used to extend the conversion into perpetuity. This is a multi-year program that will ultimately involve \$10 million in federal funds and \$9 million in state and local funds over a five year period.

To date, easements for surface water appropriations and/or groundwater rights have been acquired on approximately 2,500 acres of land in the Platte overappropriated area; a groundwater recharge pilot project has been carried out, diverting approximately 90,000 acre-feet of water out of the Platte River in April and May of 2011; and the North Dry Creek groundwater project has been initiated.

3. Platte River Cooperative Hydrology Study

The Platte River Cooperative Hydrology Study (COHYST) group, begun in 1996, has assessed the study's goals and revised them in an updated operating plan that serves to expand its present capabilities to more fully meet the current management needs of the basin. This renewed effort is known as COHYST 2010. The focus of COHYST 2010 is development of modeling tools capable of providing annual representation of a closed (measurement constrained) water budget in the Platte River Basin in Nebraska upstream of Columbus, Nebraska and downstream of Lake McConaughy and the Colorado-Nebraska state line on the North Platte and South Platte rivers, respectively. This study supports the integrated management planning process, and involves the Department, three natural resources districts, two power districts, and the Nebraska Game and Parks Commission as sponsors. Funds for the project come from the Nebraska Environmental Trust, the involved parties, and in-kind services provided by the parties.

The Department is active at all levels of the study. The Department utilizes its staff members to develop planning documents and contracts, examine the technical accuracy of modeling work,

design and maintain databases, provide model design and construction, provide technical reviews, evaluate software, and provide educational seminars in support of the COHYST study.

In February 2010, the COHYST and Conjunctive Water Management (CWM) sponsors agreed in concept on a framework to contribute to a single coordinated modeling effort to further develop tools that will meet the needs of their respective management objectives. On May 4, 2010, the COHYST sponsors and CWM sponsors met and approved an agreement to have COHYST develop the modeling tools. The proposed process includes three phases, which outline the development of an independently derived water budget and a project work plan in Phase I, work plan implementation and tool development in Phase II, and tool use and refinement in Phase III. The tools include three components, which are ultimately linked to provide a closed water budget and meet the needs of the management objectives. These components include: watershed, which partitions precipitation within the study area into various water budget terms to be used in the other components; groundwater, which refines previously conducted work and adapts to the inclusion of the other modeling components; and surface water, which will share budget terms with the other components and route the flow of water through the system. Since the 2010 annual report, COHYST has completed Phase I and realized significant progress in Phase II, which anticipates a tentative completion by December 31, 2011, subject to an externally contracted peer review of the model components and their integration. Phase III will commence following the peer review and evaluation of the peer review findings. The Department has contributed more than \$200,000 of in-kind service to COHYST under Phases I and II to date.

The Cooperative Hydrology Study data and models are expected to provide the foundation for the Platte River Conjunctive Management Study, integrated management planning studies and analyses required under the respective integrated management plans, and the five-year review procedures outlined in the Nebraska New Depletion Plan for the reach from Lake McConaughy to the Loup River confluence.

4. Western Water Use Modeling

This project is being conducted through an interlocal agreement between the Department, the North Platte Natural Resources District, and the South Platte Natural Resources District. The goal of this project is to identify strategies developed through a Management Options Plan and assess potential methods of implementation. This project focuses on the area in the Platte River Basin upstream of Lake McConaughy to the Wyoming state line as well as Lodgepole Creek in the South Platte Natural Resources District. The Department is also providing staff support to assist with redevelopment of the Western Unit of the COHYST groundwater model and review other aspects in the development of surface water operations models.

This study is expected to assist in both integrated management activities and in meeting the requirements of the Platte River Recovery and Implementation Program.

5. Lodgepole Creek Flow Evaluation

The South Platte Natural Resources District received Interrelated Water Management Plan Program Fund (IWMPPF) funding to investigate and study the impacts to the South Platte River due to depletions to Lodgepole Creek. The project has four tasks, including: 1) historical review, 2) streamflow analysis, 3) depletions analysis, and 4) augmentation feasibility. To date, a draft historical review document has been completed, and stream flow and depletion analyses have been preliminarily conducted. Limitations were identified in the depletion analyses relating to calibration of flows in the South Platte Natural Resources District, the routing of calibrated flows, and replication of wet and dry reaches; therefore, the stream flow and depletion analyses will be re-calculated when refinements to modeling tools for the basin area are adapted to more closely represent the hydrologic conditions in the Lodgepole Creek Basin. The augmentation feasibility task will be executed at such time as the updated analyses become available.

6. Overappropriated-Fully Appropriated Study

As part of Department's integrated management planning activities, a Department staff member was one of three co-authors of a September 2009 report entitled "Preliminary Estimate of Historical Stream Flow Reductions in the Overappropriated Portion of the Platte River in Nebraska." That report was prepared at the request of the Basin-Wide Stakeholder Group. This report led to further work refining procedures.

The Department and the Central Platte Natural Resources District published a request for proposals in December 2009 to solicit assistance in refining the current procedures for determining fully appropriated. A consultant was selected in 2010 and Integrated Water Management Plan Program Fund funding was approved to begin July 1, 2010. This refinement of the fully appropriated procedures is a first step in identifying the overall difference between the current and fully appropriated levels of development in the Platte Basin upstream of Elm Creek. The Department and Central Platte Natural Resources District held a stakeholder meeting in May 2011 at which the preliminary findings of the study were presented. An interim report on the project is expected to be available by August 1, 2011.

7. Excess Flow Analysis (Unappropriated Surface Water)

The Platte Basin integrated management plans call for an analysis to determine if there is unappropriated surface water available for use in retiming projects that would put the available water back to the river at times when depletions need to be balanced. The first analysis has been completed and shows that excess flows are available at certain times and locations in the basin. The analysis provides the Department with a spreadsheet tool to run various analyses with differing inputs and demands on the system. The following river reaches were analyzed: Julesburg to North Platte, Keystone to North Plate, North Platte to Brady, Brady to Cozad, Cozad to Overton, Overton to Odessa, Odessa to Grand Island, and Grand Island to Duncan. In addition to these reaches, the analysis takes into account the instream flow demands downstream of Duncan to the Louisville gage. This analysis has been completed and is available on the Department's website.

The Department and the five Platte Basin natural resources districts are now scoping a project to expand the initial analysis. The new scope will examine the operational constraints of the available excess flows and will develop criteria to evaluate potential new projects.

8. Groundwater Recharge Pilot & Flood Reduction Project

In spring 2011, the Department, natural resources districts, and various local irrigation canals collaborated to divert flood flows from the North Platte River. The Department contacted surface water irrigation districts in the Upper Platte Basin to identify those that can assist with flood flow mitigation as well as participate in a conjunctive management demonstration project. Twenty-one irrigation districts signed contracts to take a portion of the flood flows into their canals. The diverted water will flow into canals and soak into the ground through the unlined canals, pits, and other existing facilities.

Funding for these projects in the Platte River Basin will be provided by the PBHEP, which includes support from local natural resources districts and the DNR. These projects will benefit the State by moving some high flow water out of the rivers during potential flood risk times and storing some of the flows in the aquifer, potentially assisting the State with future interstate compliance efforts.

The Department has worked closely with the local natural resources districts and other water managers to develop models and other tools that allow the benefits of these types of conjunctive management strategies to be evaluated. This demonstration project builds on those models and tools, as well as allows for identification of locations best suited for these types of projects as additional opportunities present themselves in the future. The Department expects to publish an analysis of this project by the end of the 2011 calendar year.

C. North Platte Decree Implementation

The U.S. Supreme Court issued the North Platte Decree in 1945 in response to a lawsuit commenced by the State of Nebraska against the State of Wyoming in 1934. The Decree apportioned the North Platte River among Colorado, Wyoming, and Nebraska. The Decree was amended in 1953 to include the construction of Glendo Dam and Reservoir. In 1986, the State of Nebraska filed suit against the State of Wyoming. Later, Colorado and the United States again became parties to the renewed litigation. The lawsuit was resolved through a settlement finalized in March of 2001. To implement the settlement, the North Platte Decree Committee was created (NPDC) in 2001 to assist the states in monitoring, administering, and implementing the modified decree. Nebraska, Colorado, Wyoming, and the U.S. Bureau of Reclamation are parties to the NPDC.

The North Platte Decree Committee meets at least twice each year, typically in April and October. The committee focuses on implementing the water administration, reporting, and research activities outlined in the modified decree. These activities include various methods to estimate the consumptive use of irrigation water in Wyoming such as, collecting weather data, estimating evapotranspiration of irrigated crops, stream gaging, producer practice surveys,

estimating groundwater pumping and surface water diversions, tracking irrigated acres, etc. The goal of these activities is to track and further refine estimates of annual water usage in Wyoming. This assists in tracking the Decree mandated apportionment of water supplies between Wyoming and Nebraska.

The North Platte Decree Committee continued to meet at least twice a year with other special meetings scheduled as needed. In January 2010, the position of Chair rotated from the Bureau of Reclamation to the State of Wyoming. In January of 2012 it will rotate to Nebraska.

Each year, as described in Exhibit 10, the Bureau of Reclamation provides a report on the number of “trigger days” that were counted during the previous irrigation season. Trigger days describe the number of days in the irrigation season when surface water appropriations are short of water and replacement of groundwater is required in the reach between Whalen Dam and the State Line. On March 16, 2011, the report was mailed to the parties stating that the calculated number of groundwater “trigger days” for water year 2010 was 0 days. The average is 72 trigger days from water years 2002 to 2009, and including water year 2010, the average drops to 64 trigger days. Both Wyoming and Nebraska agreed with the estimate for 2010.

Wyoming has regular reporting requirements under various provisions of the Decree that are reported on at each meeting. These provisions are:

- Exhibits 4 and 12 describe the reporting requirements for intentionally irrigated acres located above Guernsey Reservoir and in the Lower Laramie River Basin.
- Exhibit 5 specifies that measurements of surface water diversions from the main stem be reported to the representatives of the North Platte Decree Committee. For 2010, no reporting was required because it was a non-allocation year.
- In Exhibit 6, Wyoming is required to report the consumptive use of irrigation water above Guernsey Reservoir.
- Exhibit 10 contains requirements regarding the tracking the use of the ground water irrigation wells that pump in the triangle area and the replacement water for their depletions to stream flow.
- Exhibits 13, 14, and 15 require monthly reports on water right applications or changes to existing water rights.

For 2010 all reports were received according to and were in compliance with the provisions of the Decree.

Under the provisions of the settlement, Wyoming was required to acquire the water rights and facilities of the Goshen Irrigation District pump station. In 2010 the issue was taken to the Wyoming Board of Control and the abandonment of the water right was approved.

The Natural Flow and Ownership Accounting Procedures (NFO), Exhibit 2 of the North Platte Decree Committee Charter, govern how water is allocated among the irrigation districts and each state on a daily basis. At each spring meeting, the committee reviews the Natural Flow and Ownership Accounting Procedures for the current year, makes necessary modifications, and gives final approval.

The duties of the Control Crest Subcommittee (CCSC) include: monitoring the performance of the stream gages that have control crest structures, assuring accurate measurements, reviewing the trigger day analysis performed by the Bureau of Reclamation, and performing other duties as assigned. In the spring of each year the subcommittee presents a report on controls located in the North Platte system and recommends any changes to the relevant procedures. In 2011 no recommended changes were made by the subcommittee. The current Chair of this subcommittee is a Department Natural Resources Specialist.

The Groundwater Wells Subcommittee is assigned the task of defining an acceptable process for reviewing well permits and evaluating hydrological connections as well as reviewing baseline wells and performing other duties as assigned. A procedure to evaluate hydrologically connected groundwater wells was adopted by the North Platte Decree Committee in the fall of 2002. No new actions were taken by the subcommittee in this fiscal year.

The Consumptive Use Subcommittee (CUSC) is tasked with scoping the work tasks and coordinating future consumptive use studies according to Exhibit 6 of the Decree settlement documents. Current assignments include the study of weather data, irrigation practices, and water balance study sites. The current Chair of this subcommittee is a Department Natural Resources Specialist.

Since 2003, the Consumptive Use Subcommittee has been working with the High Plains Regional Climate Center (HPRCC) on installing and operating weather stations. In October 2007, the subcommittee reported that three weather stations above Guernsey Reservoir had been installed and had begun collecting data. In April 2008, a decision was made about the new site for the Torrington weather station. The weather station will be relocated to the Sustainable Agriculture and Research Education Center southwest of Lingle, Wyoming. These stations will continue to be maintained by the North Platte Decree Committee.

The Consumptive Use Subcommittee has the following two projects.

Irrigation Practices

This project is described in Exhibit 6 of the Decree documents and is anticipated to be conducted every five years. The first survey of irrigation practices above Guernsey Reservoir, in the North Platte River Basin, in Wyoming, occurred in January of 2006. The 2011 survey was mailed in March. The purpose of these surveys is to track changes in irrigation practices that influence the consumptive use of irrigation water. Another survey will be conducted in 2016.

Water Balance Study Sites

This project has changed through time, since its original description in the settlement documents. The original project was to measure numerous aspects of the water budget in a small watershed in Wyoming. The North Platte Decree Committee held a two day workshop in August 2004 at which it was decided to redesign the project. That redesign, installing and maintaining flux study sites, was pursued until October 2007. At that time a decision was made to not move forward with the project in its current configuration because of the expense. Instead, the North Platte Decree Committee directed the Consumptive Use Subcommittee to a different approach, using

remotely sensed data to estimate evapotranspiration. In October 2008, the contract to perform remote sensing work above Pathfinder Reservoir was awarded to Riverside Technology. A final report was received in December of 2010. That report is currently being reviewed by the subcommittee with the purpose of returning to the North Platte Decree Committee with a proposal on how to move forward in the next step of the project.

The Official Files Ad Hoc Subcommittee was responsible for developing the protocol for the filing system that addresses all information to be retained in the North Platte Decree Committee files, both paper files and electronic data. This repository is open to public access, and also includes data referenced in the Final Settlement Stipulation and relevant documents generated by all parties to the Decree. The protocols for the repository files have been finalized and the subcommittee has been dissolved. Currently, Department staff manages the repository paper files and database.

The State Line Gage Subcommittee was created in April 2007 to evaluate the operation of the gages at and near the Wyoming/Nebraska state line. If problems exist, it is tasked with finding remedies to make the gaged flow more accurate. In October 2007, the North Platte Decree Committee decided to hire a consultant to evaluate the three measurement sites near the state line, and a Request for Proposal was approved for review. In June 2008, the study budget was approved and the contract was awarded to Aqua Engineering with a final report provided to the North Platte Decree Committee in April 2009. A workshop was held in March of 2010 to discuss next steps, and it was decided to investigate the costs of a feasibility study to improve the gage. A contract was awarded to Water Resources Solutions in January of 2011 to complete the bendway weir feasibility study. As of June 30, 2011, that work is ongoing and a report is expected by early fall 2011. The next step will be to evaluate that report and determine if it is beneficial to build the project. The current Chair of this subcommittee is a Department Natural Resources Specialist.

The Finance Standing Subcommittee was created for the purpose of investigating how the North Platte Decree Committee would address future expenditures and financial organization. This subcommittee oversees the annual budget and all contracts entered into by the North Platte Decree Committee. The committee has contracted with the Nebraska Community Foundation through 2012 for financial services, which are overseen by this subcommittee.

The Replacement Water Subcommittee was created in the fall of 2006 to work on various tasks described in Exhibits 10 and 11 of the Decree settlement documents. Its tasks as assigned through time are 1) to address the collecting of information on the basic parameters used to estimate the replacement water requirements in the Triangle area and 2) review the replacement water assumptions for tributary diversions in the Triangle area and 3) review the irrigation efficiency in the Triangle area. In November 2007, the first set of surveys was mailed to producers in the area. This activity is anticipated to occur every five years. When the next survey is mailed the responses will be compared to the previous survey responses to identify any changes in irrigation efficiency and/or in the consumptive use of irrigation water. The current Chair of this subcommittee is a Department Natural Resources Specialist.

D. South Platte Compact Activity

The South Platte Compact was signed by Nebraska and Colorado in 1923. It divides and apportions the water of the South Platte River and Lodgepole Creek between the states. The compact explicitly restricts use by Colorado appropriators located in the lower section of the river above the Colorado and Nebraska stateline. Colorado appropriators that are junior to the Western Irrigation District's water right of June 14, 1897, are restricted from use when the flow at the state line is below 120 cubic feet per second (cfs) during the irrigation season from April 1 through October 15.

The Department's Bridgeport Field Office monitors the flow at the Colorado Nebraska stateline on a daily basis during the compact established irrigation season. If flows during the irrigation season drop below the established 120 cubic feet per second, the Bridgeport Field Office supervisor coordinates with the Colorado Division of Water Resources to have occasional joint inspections of the irrigation diversion sites in the lower section of the South Platte River. The inspections are performed by staff from the Colorado Division of Water Resources, accompanied by Bridgeport Field Office personnel, in an effort to ensure that Colorado is complying with this aspect of the compact.

E. Gaging Activity

In the Upper Platte River Basin, the Department operates 44 stream gages, 58 canal gages and cooperates on an additional five gages operated by the U.S. Geological Survey.

During May, June, and July 2011, a significant amount of effort was expended monitoring high flows (including some flooding) on the North Platte River and its tributaries.

IV. LOWER PLATTE RIVER BASIN



A. Integrated Water Management Activities

The Lower Platte Basin covers seven natural resources districts, including the Lower Elkhorn, Lower Loup, Lower Platte North, Lower Platte South, Papio-Missouri River, Upper Elkhorn, and the Upper Loup. At this time, no portion of the Lower Platte River is designated as fully appropriated. The Department will continue to evaluate the Lower Platte River Basin annually as required by statutes.

The basin was preliminarily determined to be fully appropriated in December 2008. The Department made a final determination in April 2009 that the basin was not fully appropriated. Recent additions to the Groundwater Management and Protection Act require that when a

reversal of a preliminary determination of fully appropriated occurs, the natural resources districts must develop rules and regulations that limit the development of groundwater irrigated acres and the Department must limit the development of surface water irrigated acres in a manner that ensures the basin will not be determined to be fully appropriated based on the most recent annual evaluation conducted by the Department. These restrictions apply for a minimum period of four years. Additionally, the Department may forego the previously required annual evaluation of the basin over that same four-year period. The Department did not evaluate the Lower Platte Basin in the 2011 evaluation. The Lower Platte Basin will once again be required to be evaluated in the 2013 evaluation.

The Lower Platte South Natural Resources District and the Department are working to develop a joint integrated management plan (IMP) through a voluntary process. The Department and the Lower Platte South Natural Resources District have begun development of a draft set of goals and objectives for the integrated management plan and continue to work on development of the integrated management plan.

B. Studies, Programs, and Projects

1. Lower Platte River Corridor Alliance

The Lower Platte River Corridor Alliance was created in 1996 through an interlocal agreement. It is a consortium of three natural resources districts (Lower Platte North, Lower Platte South, and Papio-Missouri River) and six state agencies. The Alliance's mission is "to foster the development of locally drawn strategies, actions, and practices to protect, enhance, and restore the vitality of the river's resources." Although the Department continues to participate in Alliance meetings, in recent years it has discontinued paying dues and expends minimal staff time for Alliance related activities.

2. Lower Platte River Cumulative Impacts Study

The purpose of the Lower Platte River Cumulative Impacts Study is to study the cumulative effects of activities and practices in the Lower Platte River Corridor over time. The study is currently in phase three and involves the U.S. Army Corps of Engineers, Lower Platte South Natural Resources District, Lower Platte North Natural Resources District, Papio-Missouri River Natural Resources District, the Nebraska Game and Parks Commission, and the Department. The Department has no monetary involvement and minimal contractual staff involvement in this study.

3. Elkhorn River Streambed Conductance Project

The Elkhorn River Streambed Conductance Project was an effort initiated by the Lower Elkhorn Natural Resources District and the Department in June 2007 with work being conducted by University of Nebraska-Lincoln researchers. The Department obligated \$42,000 to the project. Its objectives were: 1) to determine the architecture of the channel sediments in the Elkhorn River and its tributaries from which the streambed thickness was determined, 2) to determine the vertical hydraulic conductivity of the channel sediments from the top to the depth of up to 50 feet, and 3) to quantify the hydrologic relations between rivers and their adjacent aquifers. The

project has been completed and two reports have been produced describing the results of the study.

C. Gaging Activity

In the Lower Platte River Basin, the Department does not operate stream gages on the Platte River. However, the Department does make use of five gages operated by the U.S. Geological Survey (USGS).

On the Elkhorn River and its tributaries the Department operates 11 stream gages, one canal gage, and cooperates with the U.S. Geological Survey on one gage. During June 2010, a significant amount of stream gaging equipment was damaged or required relocation due to flooding of the Elkhorn and Loup river systems.

On the Loup River and its tributaries the Department operates 10 stream gages and 23 canal gages.

V. REPUBLICAN RIVER BASIN



A. Integrated Water Management Activities/Integrated Management Plans

The Republican Basin natural resources districts, which include the Lower, Middle, and Upper Republican, were declared fully appropriated after the passage of LB 962 in 2004. These natural resources districts, in cooperation with the Department, implemented Integrated Management Plans (IMPs) for the period 2005 - 2007. Integrated management plans and complementary rules and regulations implemented by the districts and the Department were put in place to govern the use of hydrologically connected waters in the basin. These integrated management plans represent a blueprint for sustainable water management in the Republican River Basin and facilitate Nebraska's compact compliance. *Nebraska Revised Statute* § 46-715 (4)(b) dictates that the regulatory measures in an integrated management plan must "be sufficient to ensure that the State will remain in compliance with applicable state and federal laws and with any applicable interstate water compact or decree"

The original integrated management plans for the Republican River Basin lasted from 2005 to 2007 and required a pumping reduction of five percent from a representative baseline period (1998 - 2002). The integrated management plans limited the depletions by groundwater users within each natural resources district to the district's fixed percentage of Nebraska's total allowable Computed Beneficial Consumptive Use (CBCU) for groundwater (CBCUg) in the basin. The districts in the basin previously agreed to limit their groundwater to the following shares of Nebraska's CBCUg: 26 percent for the Lower Republican Natural Resources District, 30 percent for the Middle Republican Natural Resources District, and 44 percent for the Upper

Republican Natural Resources District. This requirement ensures compact requirements will be met under any and all water supply conditions that may occur in the basin.

During 2007 and early 2008, the Department, in conjunction with the natural resources districts, adopted revisions to their original integrated management plans. The second-generation integrated management plans in the Republican River Basin were originally adopted to be effective during the five-year period from 2008 to 2012. These integrated management plans increased the target pumping reduction to 20 percent from the baseline period (1998 – 2002).

In other words, the integrated management plans required the natural resources districts to take actions to reduce groundwater pumping in their respective districts in order to meet a consumptive use reduction of 20 percent from the 1998-2002 pumping level. Like the original integrated management plans, the second generation integrated management plans also limited each natural resources district's allowable groundwater depletions to the natural resources district's fixed percentage of Nebraska's total allowable CBCUg.

Two events led Nebraska to begin a new round of revisions on the 2008 integrated management plans. First, during arbitration with Kansas and Colorado, it was recommended by the arbitrator that Nebraska implement additional regulations for water-short years. Second, the litigation over funding provided by LB 701 (2007) stalled any viable non-regulatory management options in the basin. These events spurred a new effort by the natural resources districts and the Department to agree to additional regulatory measures to be incorporated into the existing integrated management plans. The additional regulations would be necessary only when the State is at risk of exceeding water use allowed under the compact, primarily during water-short year administration.

The Department and the natural resources districts worked together to determine viable options for additional dry-year regulatory controls in the integrated management plans. Significant steps were taken to develop dry-year forecasting procedures and potential controls which could be implemented. Based on initial public comments, a choice was made to work toward implementing plans that would leave pumping allocations close to the current levels for normal to wet years, but require management action be taken sufficient to offset any potential overuse, or in the alternative, require curtailment of pumping.

In August 2010, the Upper Republican Natural Resources District, the Middle Republican Natural Resources District and the Department adopted revised joint integrated management plans for those districts.

B. Studies, Programs, and Projects

1. Frenchman Valley Appraisal Study

The Frenchman Valley Appraisal Study was a cooperative effort with the U.S. Bureau of Reclamation to develop and evaluate alternative water management scenarios in the study area. One goal of the study was to optimize the economic and environmental benefits of the water resources in the area. The most recent draft study report was completed in July 2009 and it now

appears that the report will not be finalized. Participants in the study process included the U.S. Bureau of Reclamation, the Department, Frenchman Valley and H & RW irrigation districts, the Upper Republican Natural Resources District, the Middle Republican Natural Resources District, and the Nebraska Game and Parks Commission.

2. Republican River Basin Conservation Study

The Final Settlement Stipulation (FSS), which was approved on May 19, 2003, required the States of Kansas, Nebraska, and Colorado to form a Conservation Committee. The Final Settlement Stipulation required the Conservation Committee to develop a proposed study plan by April 30, 2004, to determine the quantitative effects of non-federal reservoirs and land terracing practices on water supplies in the Republican River Basin above Hardy, Nebraska. In January 2003, each state and the United States appointed individuals to represent them on the Conservation Committee. The committee members developed a study plan and transmitted it to members of the Republican River Compact Administration (RRCA). The Republican River Compact Administration approved the study plan in July 2004.

The Republican River Basin Conservation Study consists of four primary components:

- Evaluation and modification of existing models
- Development of databases
- On-the-ground verification
- Application of the water balance and GIS models

The Final Settlement Stipulation specifies that the states and the United States will spend no more than one million dollars, of which the United States will be responsible for 75 percent and each state will be responsible for one-third of the remaining 25 percent (\$83,333 per state). The states' portions may be provided entirely through in-kind contributions. If the cost of the study exceeds one million dollars, the United States will be responsible for the entire additional amount.

Nebraska has provided in-kind contributions toward the study by selecting sites, assisting with installation of the equipment for monitoring the operation of 20 reservoirs, and by assisting with other work related to the study. Nebraska has conducted site visits to the 20 reservoir sites at least twice per year to download water level recorder data and to collect water surface perimeter data using Global Positioning System (GPS). Nebraska has surveyed these (and other non-federal) reservoirs to produce area-capacity tables. Nebraska has contributed approximately \$191,000 of in-kind services toward the study from the date of approval of the study on July 27, 2004, through March 30, 2010. The total cost of the study was originally estimated to be \$1,000,000. The final cost will be somewhat higher due to an expanded scope of work. The project has run long; the original due date was mid-2009; it is hoped that a near-final draft will be completed during 2011.

Final modeling scenarios of the influence of terraces and small reservoirs on the evapotranspiration, runoff and deep percolation (groundwater recharge) water budget components are currently being performed. These three water budget terms for: 1) lands in

hydrologic units with reservoirs and terraces, 2) with reservoirs and no terraces, and 3) with terraces and no reservoirs, are being computed, and the volumes compared to the situation without reservoirs and terraces to quantify the effects of reservoirs and/or terraces on the water budget. These scenarios are being modeled for all combinations of five different terrace types, seven different cropping schemes, and three soil types. The changes in runoff rates, along with transmission loss factors, are used to quantify the change in runoff volumes for different hydrologic units in the Republican River Basin. It is anticipated that the project will near completion during 2011.

3. *Research on Estimation of Evapotranspiration from Riparian and Invasive Species Using Remote Sensing, Modeling and In Situ Measurements in the Republican River Basin*

The Department plans to use the results from this study to: 1) determine if the removal of invasive species will result in a reduction of long-term evapotranspiration (ET) from riparian systems, and 2) develop methods to estimate monthly and annual riparian vegetation evapotranspiration throughout the Republican River Basin. Methods to relate evapotranspiration from riparian systems to groundwater levels and water supplies are also sought to improve groundwater modeling. The study is being funded through the Department, has a budget of \$1,060,485 and is expected to be completed by September 2011. Study efforts are being led by the Department of Biological Systems Engineering at the University of Nebraska-Lincoln.

4. *Republican River Basin Water Sustainability Task Force.*

The purpose of the 27 member Republican River Basin Water Sustainability Task Force is to define water sustainability for the Republican River Basin, develop and recommend a plan to help reach water sustainability in the basin, and develop and recommend a plan to help avoid a Water-Short Year in the basin. The task force is housed within the Department for administrative and budgetary purposes only and the Director serves as a member of the Task Force. The Task Force has been charged with presenting a preliminary report to the governor and the legislature on or before May 15, 2011, and a final report before May 15, 2012. It has a total two-year budget of \$50,000. The Task Force was created with the passage of LB 1057 in 2010 and 18 of the 22 members represent various basin interests and are appointed by Governor Heineman. The other four voting members represent the Nebraska Game and Parks Commission, the Department of Agriculture, The University of Nebraska Institute of Agriculture, and the Department. The statutes also direct the chairperson of the executive board of the Legislative Council to appoint five legislators who meet stated requirements as ex-officio members.

The Task Force met six times in FY 10-11 with their initial meeting occurring on June 23, 2010. Subsequent meetings were held in Alma, Holdrege, McCook, Lincoln and McCook. On April 11, 2011, the Task Force approved the "Preliminary Report of the Republican River Basin Water Sustainability Task Force" fulfilling the initial statutory reporting requirement. The Task Force was budgeted \$50,000 through the Water Resources Cash fund and committed a large portion of that amount to contracting for facilitation services. Those services were contracted with the University of Nebraska Public Policy Center. Although the Department administers the funding for the Task Force, those funds are not included in the budgetary totals for this report.

The preliminary report provides background information concerning the legislative charge of the Task Force, its membership, and its operational rules. It also describes Task Force accomplishments as of April 11, including a chronology of meetings, work on the final report, and a general working definition of water sustainability (the main task force accomplishment as of that date). The preliminary report also describes what the Task Force plans to accomplish over the following year as it completes its legislative charge.

5. Republican River Basin Conjunctive Management Study

The Republican River Conjunctive Management Study is expected to proceed in two phases. Phase I is the conceptualization of various scenarios and the development of hydrologic tools, such as surface water operations and runoff models. Phase II of the study focuses on the analysis of conjunctive management scenarios, evaluating those scenarios to assess the hydrologic and economic implications, and developing a plan for implementation. The Department and Republican River Management Districts Association are collaborating to fund this effort. An initial draft report on Phase I has been completed with full project completion scheduled for June 30, 2012.

C. Republican River Compact

The Republican River Compact was implemented in 1943 and allocates the streamflow supply of the Republican Basin above Hardy, Nebraska between Colorado, Kansas, and Nebraska. Traditionally, the Compact accounting focused on measured streamflows and surface water uses. In 1998, Kansas sued Nebraska alleging significant depletions of streamflow in the Republican River Basin from groundwater use. The Final Settlement Stipulation (FSS), signed in 2002, updated the Compact accounting to include the calculation of stream depletions due to groundwater use and stream accretions due to imported water supplies from the Platte Basin.

In 2008, Colorado, Kansas, and Nebraska entered into dispute resolution regarding several issues, including future compliance. In June 2009, the arbitrator, Karl Dreher, issued a finding that the integrated management plans may be adequate during years with average and above-average precipitation, but may be inadequate during dry years. His concern was that although the natural resources districts' allowable depletions to streamflow are limited to 100 percent of Nebraska's allowable depletions, there were no details in the plans to achieve this.

The Department and the natural resources districts have worked to revise the integrated management plans to address this issue.

In the spring of 2011 the United States Supreme Court accepted the case regarding issues which were previously arbitrated. The current litigation focuses on Nebraska's non-compliance in 2005-2006, future proposed remedies for ensuring compliance, and technical issues related to methods used in Compact accounting.

D. Gaging Activity

In the Republican River Basin the Department operates 19 stream gages, 10 canal gages and cooperates with the U.S. Geological Survey on six gages.

During FY 2011 and FY 2012, the Department expects to replace five nitrogen tank-based bubbler systems with two pump-based systems and three radar gages. This change will increase the safety of handling and using the stream gaging equipment and decrease the overall operating costs.

VI. NIOBRARA RIVER BASIN



A. Integrated Water Management Activities/Integrated Management Plans

Portions of the Upper Niobrara White Natural Resources District, including the Hat Creek Basin, the White River Basin, the portion of the Niobrara River Basin above the Mirage Flats Diversion Dam, the Box Butte Creek Sub-Basin, and the Snake Creek Sub-Basin were declared fully appropriated in 2004. Subsequently, the Niobrara River above Spencer Dam was determined fully appropriated in January 2008, including areas of Dawes, Sheridan, and Box Butte counties hydrologically connected to the Lower Niobrara River below the Mirage Flats Diversion. Several natural resources districts challenged the fully appropriated designation, and in 2011, the Nebraska Supreme Court reversed the 2008 fully appropriated determination on the Lower Niobrara River Basin. State statutes require that following the reversal, the natural resources districts (Upper Niobrara White, Middle Niobrara, Lower Niobrara, Upper Loup, and Upper Elkhorn) develop rules and regulations to limit water development for four years.

The Upper Niobrara White Natural Resources District Integrated Management Plan was adopted in 2009. The first annual integrated management plan meeting was June 2010, at which time both the Upper Niobrara White Natural Resources District and the Department evaluated the effectiveness of the IMP. It was decided to clarify and rewrite portions of the plan. The second annual integrated management plan meeting was held July 19, 2011.

The expected long-term availability of surface water supplies and hydrologically connected groundwater of the Niobrara Basin below Spencer Dam was evaluated in the “2011 Annual Evaluation of Availability of Hydrologically Connected Water Supplies.” The Department concluded that the portion of the basin examined was not fully appropriated at that time.

B. Studies, Programs, and Projects

1. Hydrogeologic and Hydrostratigraphic Framework for the Niobrara Basin

This study provides geospatial coverages of aquifer properties throughout the upper portion of the Niobrara River Basin. It is intended to help expand the Box Butte groundwater model. The study report was completed in August 2010. The Nebraska Conservation and Survey Division conducted the study.

2. Conjunctive Water Use Model of the Upper Niobrara River Basin

The operations model will combine three separate models, CROPSIM, a groundwater model, and a surface water model to develop operational scenarios that maximize water use efficiency. All portions of the operations model are currently in development. The project is funded through Interrelated Water Management Plan Program Fund, with the Upper Niobrara-White Natural Resources District as the sponsor and the Department as a partner. The total projected cost is \$154,000. The expected project completion date is summer 2012. This project will become part of the larger Niobrara Basin Study.

3. Niobrara Basin Study

In June 2010, a proposal was submitted for U.S. Bureau of Reclamation assistance on a Niobrara River Basin Study. In August, Reclamation provided notification that the proposal was approved. It is anticipated that \$350,000 worth of Reclamation staff assistance will be provided. The purpose of the study will be to provide water supply and demand information for evaluation and implementation of water management options for the basin. Department staff will also contribute to the cooperative effort. May 2011, the Reclamation and the Department signed the Memorandum of Agreement, effectively starting the project. Project completion is anticipated for 2013.

C. Compact Activity

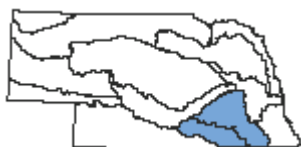
In 1962, the States of Wyoming and Nebraska ratified the Upper Niobrara River Compact. The Compact provides for an equitable division of the available surface water supply of the basin. It also provides for acquisition of information on groundwater and underground water flow necessary for apportioning said flow and calls for the states to address issues that may lead to disagreements. On October 25, 2010, the Department and the Wyoming State Engineer's Office met to discuss the Niobrara River Compact. At the compact meeting, both states discussed stream gaging efforts, surface water administration, and the Lusk Area Groundwater Study. On April 27, 2011, a technical subcommittee held a conference call to discuss the results of the joint U.S. Bureau of Reclamation and Department Niobrara Basin Study.

D. Gaging Activity

In the Niobrara management area the Department operates eight stream gages, and uses information from an additional two gages operated by the U.S. Geological Survey.

During Fiscal Years 2011 and 2012 the Department expects to replace two nitrogen tank-based bubbler systems with two pump-based systems. This change will increase the safety of handling and using the stream gaging equipment and decrease the overall operating costs.

VII. BLUE RIVER BASIN



A. Integrated Water Management Activities

The Blue River Basin is divided into three natural resources districts: the Little Blue, Lower Big Blue, and Upper Big Blue (the Tri-Basin Natural Resources District also contains a portion of the Blue River Basin). At this time, no portions of the Blue River Basin have been designated as fully appropriated. Therefore, pursuant to Nebraska statutes, the Department must annually evaluate the basin. In the “2011 Annual Evaluation of Availability of Hydrologically Connected Water Supplies,” the Department concluded that the Basin was not fully appropriated at that time. The Department will continue evaluating available data and other information to support its basin evaluation. Development of data and information will seek to achieve a common level of detail with other basins where statute requires the Department to perform an annual evaluation.

The hydrologically connected waters of the Platte Basin extend into the Upper Big Blue Natural Resources District. The Department and the Upper Big Blue Natural Resources District have completed an integrated management plan. More information is provided in the Upper Platte Basin portion of this report.

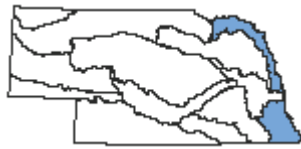
B. Blue River Compact Activity

In 1971, Kansas and Nebraska entered into the Blue River Compact. The Compact was put in place to promote interstate comity and achieve an equitable apportionment and orderly development of the waters of the Big Blue River Basin. It requires Nebraska to regulate diversions of natural flow from streams in the basin and certain irrigation wells when necessary and to cooperate in maintaining the water quality of the Blue Basin. Compact meetings generally occur each spring and the 2011 meeting took place on May 18 in Marysville, Kansas.

C. Gaging Activity

In the Blue River Basin, the Department operates six stream gages.

VIII. MISSOURI RIVER MAINSTEM BASIN AND TRIBUTARIES AND NEMAHA RIVER BASIN



A. Integrated Water Management Activities

At this time no portion of the Missouri Tributaries has been declared fully appropriated and no portion of the Nemaha River Basin has been declared fully appropriated. The “2011 Annual Evaluation of Availability of Hydrologically Connected Water Supplies” examined the Missouri Tributaries’ Basins, including the Nemaha Basin, and the Department found the basins were not fully appropriated at that time.

B. Studies, Programs, and Projects

1. Missouri River Association of States and Tribes (MoRAST)

In 2006, the creation of the Missouri River Association of States and Tribes (MoRAST) was authorized by adoption of a joint resolution by the Mni Sose Intertribal Water Rights Coalition and the governors of the states of Wyoming, Montana, North Dakota, South Dakota, Nebraska, Iowa, and Kansas. MoRAST is an interstate and tribal organization that was formed to help resolve issues of concern to the basin states and tribes, and to serve as a forum to foster communication and information exchange among the member states, tribes, and various other governmental units. Additionally, MoRAST was formed to facilitate the management of the natural resources of the Missouri River Basin, including water resources, fish, and wildlife, while considering the impacts to the economic, historical, cultural, and social resources.

The MoRAST by-laws, which were adopted by the Board of Directors in 2006, were modified in 2008 to provide for an equal number of directors from the states and the tribes, which is currently thirteen each. Each state has a representative of the state water agency and one for the state fish and wildlife agency, with the exception of Iowa, which chose to have only one representative. Director Dunnigan is the Department representative. The group met twice in FY 11, on September 22-23, 2010 in Rapid City, South Dakota, and on March 7 and 8, 2010, in Nebraska City. Those meetings included discussion on organizational response to the Missouri River Authorized Purposes Study (MRAPS), the U.S. Army Corps of Engineers (USACE) Missouri River Annual Operating Plan, and the surplus water issue.

Since November 2008, the Department has organized four meetings of Missouri River stakeholders to provide input to the Nebraska MoRAST representatives. The stakeholders have helped provide a better mutual understanding of the needs of Nebraska river users, provided background for MoRAST meetings, and presented informed stakeholder perspectives regarding federally led efforts. All four meetings have taken place at the Papio-Missouri River Natural Resources District offices in Omaha. The only FY 11 meeting was held on November 15, 2010,

and included agenda items on the Missouri River Ecosystem Restoration Plan, the Missouri River Authorized Purposes Study, the Missouri River Recovery Implementation Committee, U.S. Army Corps of Engineers Missouri River operations, natural resources district cooperative activity and a general session on issues of concern to attendees.

2. Missouri River Recovery Implementation Committee (MRRIC)

MRRIC is a seventy member stakeholder committee that represents a wide array of local, state, tribal, and federal interests throughout the Missouri River Basin. MRRIC was created to guide the prioritization, implementation, monitoring, evaluation, and adaptation of recovery actions and provide input on the social, economic, and cultural values associated with any plans associated with the Missouri River Ecosystem Restoration Plan (MRERP) and on activities in the existing Missouri River Recovery Program (MRRP). The Department's Planning Assistance Division Manager is the State's representative on this committee and the Department's Planning Coordinator acts as the alternate. Other members of the committee from Nebraska represent fish and wildlife interests (two members), thermal power (two members), water quality (one member), and the U.S.D.A. Natural Resources Conservation Service.

3. Missouri River Ecosystem Restoration Plan (MRERP)

The Missouri River Ecosystem Restoration Plan is a long-term study authorized by the Water Resources Development Act of 2007, in which the U.S. Army Corps of Engineers, in partnership with the U.S. Fish and Wildlife Service, will identify actions required to mitigate losses of aquatic and terrestrial habitat, recover federally listed species under the Endangered Species Act, and restore the ecosystem to prevent further declines among other native species. The Nebraska Game and Parks Commission represents Nebraska in the effort, but Department staff have also participated on technical teams.

4. Missouri River Recovery Program (MRRP)

The Missouri River Recovery Program is a program of the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service and its mission is to "Implement actions to accomplish Missouri River ecosystem recovery goals in coordination and collaboration with agency partners and stakeholders." The program is currently purchasing or obtaining easements lands along the Missouri River below Sioux City, Iowa for purposes of constructing sandbar habitat and shallow water habitat for fish and wildlife purposes and studying the science needed for recovery.

5. Missouri River Authorized Purposes Study (MRAPS)

The Missouri River Authorized Purposes Study is a congressionally authorized study to review the project purposes established by the Flood Control Act of 1944. The study is tasked with analyzing the eight authorized purposes, including flood control, water supply, navigation, water quality, irrigation, recreation, hydropower, and fish and wildlife, in the view of the current values and priorities to determine if changes to the existing purposes and federal water resource infrastructure may be warranted.

The U.S. Army Corps of Engineers worked with tribes, federal and state agencies, and other stakeholders within the basin. Scoping meetings were held in summer 2010 and in late June the Department provided an agency input letter for the effort. Natural resources districts along the river also provided a joint comment letter. Department staff has closely monitored this process and attended meetings to keep informed. The study did not receive federal funding for continuation and completion for 2011. However, because of the flooding that has occurred on the Missouri River this year, discussions on revival of the study could occur.

6. Other Missouri River Activity

The U.S. Army Corps of Engineers regulates the Missouri mainstem reservoir system under the provisions of the Missouri River Master Manual. The U.S. Army Corps of Engineers also issues an annual operating plan and takes public comments on the plan. Department staff continue to monitor the U.S. Army Corps of Engineers' river regulation and decisions, including decisions regarding pulse flows and activity in producing the annual operating plan. The role of the U.S. Army Corps of Engineers in river operations was the subject of considerable scrutiny during the high flows and flooding in the spring 2011 season. In addition, the previously noted surplus water issue is expected to receive considerable attention during the upcoming fiscal year.

a. Master Manual/Annual Operating Plan

The U.S. Army Corps of Engineers wrote what is now called "The Master Manual" describing how the river is to be operated. The first master manual describing operational criteria for the Missouri River mainstem was originally developed in 1960 and subsequently revised in 1973, 1975, and 1979, 2004 and 2006. The Corps studied proposed changes from 1989 to 2002 before making the 2004 updates. The U.S. Fish and Wildlife Service issued a 2000 Biological Opinion on the Master Manual and a 2003 Amended Biological Opinion.

Each year the U.S. Army Corps of Engineers issues an "Annual Operating Plan" describing expected actions based on the reservoir storage, expected runoff, and other factors. The Annual Operating Plan is to be based on the overriding Master Manual. Courts acknowledge that the "dominant" functions of the 1944 Flood Control Act include flood control and downstream navigation, but they also acknowledge that other river interests should similarly be provided for. The "Corps...must consider and balance river interests to achieve maximum benefits."¹

The Master Manual is subject to judicial review to ensure that the operations conform to the manual. Any permanent amendment to the existing provisions must go through the procedures contained in 33 C.F.R. § 222.5. The U.S. Army Corps of Engineers is permitted to vary its operations in the event that changed circumstances require it to do so, but this discretion does not eliminate the propriety of judicial review of the lawfulness of the action.²

Department staff review the Annual Operating Plan and would be involved in any proposed changes to the Master Manual. The recent flooding on the Missouri River during the spring and summer of 2011 has called attention to these documents at both the local, state, and federal level

¹ In re Operation of the Missouri River System No. 03-MD-1555 (PAM)

² In re Operation of the Missouri River System No. 03-MD-1555 (PAM)

and it is expected there may be many meetings and documents to review and possible federal legislation as a result of the flood.

b. Surplus Water Issue

The surplus water issue arose in late 2010 when the U.S. Army Corps of Engineers issued a draft environmental impact statement and request for comments on the Missouri River mainstem dam and reservoir located in North Dakota. The issue was existing withdrawals from Lake Sakakawea and proposed withdrawals from Lake Sakakawea and the U.S. Army Corps of Engineers' determination that such withdrawals required easements and payments for storage space, even though there are some existing withdrawals that have occurred for many years. The U.S. Army Corps of Engineers does not obtain surface water appropriations from the states. A number of Missouri River Association of States and Tribes states, including Nebraska, have indicated multiple concerns with the policy and whether it is in compliance with existing laws, regulations and U.S. Army Corps of Engineers' policy.

Early in 2011, Department staff attended a meeting with the U.S. Army Corps of Engineers regarding information the Corps needed for purposes of issuing a similar report on Lewis & Clark Lake. The Corps has stated that such reports will be issued for each of the mainstem reservoirs. The final environmental impact on Lake Sakakawea has not been issued. Department staff continue to review information and are keeping informed on new developments across the basin.

C. Gaging Activity

The Department does not operate stream gages on the Missouri River or its minor tributary streams. The Department uses information from nine Missouri River gages operated by the U.S. Geological Survey. Also, in the Nemaha River Basin, the Department does not operate stream gages. The Department utilizes data from the three active U.S. Geological Survey gages in the Basin.

IX. (TABLE 1) - PLANNING & REVIEW PROCESS EXPENDITURES FY 11

AND BUDGET FYs 2012-2016* (for FYs 11 and 12 Includes combined expenditures and budget respectively for Budget Program 334 subprograms 04 Planning and Assistance, 07 Streamgaging, 019 Water Resources (LB962), and 021 Interstate Compacts and Decrees with Limited Exceptions) The Water Resources Cash Fund budget for FY 12 is also noted in a footnote.****

	FY 2011 (est.)*	FY 2012*	FY 2013	FY 2014	FY 2015	FY 2016
Personal Services	\$1,751,724	\$1,738,562	\$1,738,562	\$1,738,562	\$1,738,562	\$1,738,562
Travel Expenses	\$43,416	\$120,066	\$120,066	\$120,066	\$120,066	\$120,066
Operating Expense – SOS Temporary Personnel	\$52,781	\$39,336	\$39,336	\$39,336	\$39,336	\$39,336
Operating Expense- Mgmt consultant, Contractual Services and Engineering & Architectural Services***	\$533,557	\$2,589,861	\$1,807,974	\$1,807,974	\$1,807,974	\$1,807,974
Equipment, Computer and Software	\$38,725	\$67,000	\$67,000	\$67,000	\$67,000	\$67,000
Operating Expense - Other	\$254,848	\$115,000	\$115,000	\$115,000	\$115,000	\$115,000
Capital Outlay/Fixed Assets Except Computer	\$26,500	\$101,000	\$101,000	\$101,000	\$101,000	\$101,000
TOTAL	\$2,701,551	\$4,770,825	\$3,988,938	\$3,988,938	\$3,988,938	\$3,988,938

* Expenditure and budgetary numbers provided for FYs 11 and 12 respectively encompass the entire budgets of the Planning Assistance Division and the Integrated Water Management Division under Budget Program 334. This includes the budgets of Subprogram 04 Planning and Assistance, Subprogram 07 Streamgaging, Subprogram 019 Water Resources (LB 962), and Subprogram 021 Interstate Compacts and Decrees with the exception of \$1,357,014 set aside in FY 12 as contingency funding for Republican River related legal issues and \$3,279,784 in FY 12 funds set aside for State matching funds for the Conservation Reserve Enhancement Program (CREP). The combined total filled staff positions in the two Divisions was 20.5 as of July 26, 2011. In addition to the budget above, staff from the agency Floodplain/Dam Safety/Surveys Division provide floodplain planning that is included in this report, but not reported in this budget table. Also not included in this table are Water Resources Cash Fund monies, Interrelated Water Management Plan Program Fund monies or other pass through aid monies outside of these four budget programs. However, because of the close relation of some of these funds, reports on planning related activities they fund are included in the report.

** Water Resources Cash Fund monies are used for work and aid related to a variety of water management and implementation activities. In FY 12 those funds include approximately \$5,624,895 in carryover funding, \$3.3 million in general fund appropriations, and an additional anticipated \$3.3 million in Nebraska Environmental Trust funds which the Department is required to apply for under the provisions of LB 229 (2011).

*** The figures for FY 2013 through FY 2016 include \$1,153,267 designated as aid to local governments at discretion of Department.

